

IN THE CLAIMS

Please add new Claims 18-68 as follows:

18. In a highway crash cushion of the type comprising an array of diaphragms and a plurality of energy absorbing elements disposed between the diaphragms, the improvement comprising:
a single rail disposed under the crash cushion and anchored to a support surface;
a plurality of guides, each coupled to a respective one of the diaphragms and substantially centered with respect to the respective diaphragm;

the guides mounted on the rail to slide along the rail and to restrict movement of the respective diaphragms with respect to the rail in both lateral directions;

the rail substantially centered with respect to the diaphragms;

at least some of the diaphragms each coupled to a respective leg assembly extending beneath the respective diaphragm on both sides of the rail to support the diaphragm on the support surface.

19. In a highway crash cushion of the type comprising a diaphragm and at least one energy absorbing element disposed adjacent the diaphragm, the improvement comprising:

a support structure disposed under the crash cushion and comprising a first end and a second end, the support structure being anchored to a support surface between the first and second ends;

a guide coupled to the diaphragm;

the guide mounted to slide along the support structure and to restrict movement of the diaphragm with respect to the support structure in at least one lateral direction;

Sub C1
the diaphragm coupled to a leg assembly extending beneath the diaphragm on at least one side outboard of the support structure to support the diaphragm on the support surface.

20. In a highway crash cushion of the type comprising a diaphragm and at least one energy absorbing element disposed adjacent the diaphragm, the improvement comprising:

a support structure disposed under the crash cushion and anchored to a support surface, the support structure comprising at least two axially aligned, releasably interconnected support structure segments;

a guide coupled to the diaphragm and mounted to slide along the support structure;

each of the at least two support structure segments being shaped to restrict movement of the diaphragm with respect to the support structure in at least one lateral direction.

Sub C2
21. In a highway crash cushion of the type comprising a diaphragm and at least one energy absorbing element disposed adjacent the diaphragm, the improvement comprising:

a support structure disposed under the crash cushion and anchored to a support surface;

a guide coupled to the diaphragm;

the guide mounted to slide along the support structure and to restrict movement of the diaphragm with respect to the support structure in at least one lateral direction, the guide mounted to slide along the support structure without extending below a lower surface of the support structure;

the diaphragm coupled to a leg assembly extending beneath the diaphragm on at least one side outboard of the support structure to support the diaphragm on the support surface.

Sub
C2

~~22. The invention of Claim 19 or 20 wherein the guide is mounted to slide along the support structure without extending below a lower surface of the support structure.~~

~~23. The invention of Claim 19 or 20 wherein the guide is mounted to slide along the support structure and to allow contact between a lower surface of the support structure and the support surface.~~

24. The invention of Claim 21 wherein the guide is mounted to slide along the support structure and to allow contact between the lower surface of the support structure and the support surface.

~~25. The invention of Claim 20 or 21 wherein the support structure comprises a first end and a second end and is anchored to the support surface between the first and second ends.~~

26. The invention of Claim 19, 20, or 21 wherein the support structure is anchored to the support surface under the crash cushion.

27. The invention of Claim 19, 20, or 21 wherein the support structure is anchored to the support surface under the diaphragm or the at least one energy absorbing element.

28. The invention of Claim 19, 20, or 21 wherein the support structure is anchored to the support surface at a first location and wherein the diaphragm moves past the first location during collapse of the crash cushion.

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C3

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29. The invention of Claim 19 or 21 wherein the support structure comprises a single rail.

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30. The invention of Claim 19 or 21 wherein the support structure comprises a plurality of axially aligned, releasably interconnected support structure segments.

31. The invention of Claim 30 wherein at least one support structure segment forms a recess at one end, the recess adapted to receive a protrusion extending outwardly from an adjacent support structure segment.

32. The invention of Claim 31 wherein the protrusion extending outwardly from the adjacent support structure segment is formed in the adjacent support structure segment.

33. The invention of Claim 20 wherein at least one support structure segment forms a recess at one end, the recess adapted to receive a protrusion extending outwardly from an adjacent support structure segment.

34. The invention of Claim 33 wherein the protrusion extending outwardly from the adjacent support structure segment is formed in the adjacent support structure segment.

35. The invention of Claim 20 wherein the diaphragm is coupled to a leg assembly extending beneath the diaphragm on at least one side outboard of the support structure to support the diaphragm on the support surface.

Sub C4
36. The invention of Claim 19, 21, or 35 wherein the guide and the leg assembly provide resistance to overturning in the at least one lateral direction.

37. The invention of Claim 19, 20, or 21 wherein the guide is mounted to restrict movement of the diaphragm with respect to the support structure in both lateral directions.

38. The invention of Claim 19, 21, or 35 wherein the leg assembly extends beneath the diaphragm on both sides outboard of the support structure to support the diaphragm on the support surface.

39. The invention of Claim 19, 20, or 21 wherein the support structure comprises first and second flanges, and wherein the guide extends under the flanges to prevent excessive upward movement of the diaphragm with respect to the support structure.

40. The invention of Claim 19, 21, or 35 wherein the leg assembly extends on both sides of the support structure such that the leg assembly extends laterally outwardly of all of the guide and laterally outwardly of all of the support structure.

41. The invention of Claim 19, 21, or 35 wherein the leg assembly comprises two legs, each leg extending on a respective side of the support structure such that the legs extend laterally farther from a centerline aligned with the support structure than both the guide and the support structure.

Sub
C4

~~42. The invention of Claim 19, 21, or 35 wherein the leg assembly comprises two legs arranged such that all of the support structure and the guide are disposed between the legs.~~

43. The invention of Claim 19, 20, or 21 wherein at least a forward portion of the crash cushion is freestanding.

44. The invention of Claim 19, 20, or 21 further comprising an additional diaphragm and an additional energy absorbing element disposed between the additional diaphragm and the first-mentioned diaphragm.

45. The invention of Claim 44 further comprising a fender panel extending alongside the additional diaphragm and the first-mentioned diaphragm.

46. The invention of Claim 44 further comprising an additional guide coupled to the additional diaphragm, wherein the additional guide is mounted to slide along the support structure and to restrict movement of the additional diaphragm with respect to the support structure in at least one lateral direction.

47. The invention of Claim 46 wherein the additional guide is mounted to restrict movement of the additional diaphragm with respect to the support structure in both lateral directions.

48. The invention of Claim 44 wherein the support structure is anchored to the support surface between the additional diaphragm and the first-mentioned diaphragm.

Sub C5
49. The invention of Claim 19, 21, or 35 further comprising an additional diaphragm and an additional energy absorbing element disposed between the additional diaphragm and the first-mentioned diaphragm, wherein the additional diaphragm is coupled to an additional leg assembly extending beneath the additional diaphragm on at least one side outboard of the support structure to support the additional diaphragm on the support surface.

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50. The invention of Claim 19, 21, or 35 further comprising an additional diaphragm and an additional energy absorbing element disposed between the additional diaphragm and the first-mentioned diaphragm, wherein the additional diaphragm is coupled to an additional leg assembly extending beneath the additional diaphragm on both sides outboard of the support structure to support the additional diaphragm on the support surface.

51. The invention of Claim 19, 21, or 35 further comprising:

an additional diaphragm;
an additional energy absorbing element disposed between the additional diaphragm and the first-mentioned diaphragm;
an additional leg assembly, the additional leg assembly and the first-mentioned leg assembly each comprising an upper portion mounted to a respective one of the additional diaphragm and the first-mentioned diaphragm, a lower portion, two side portions, and a centerline extending between the side portions;

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C5

each said lower portion connected to two feet shaped to support the respective leg assembly on the support surface;

the feet extending outwardly from the respective leg assembly, away from the centerline, such that the feet are separated from the respective centerline by a maximum distance D_F , the side portions are separated from the respective centerline by a maximum distance D_L , and the ratio D_F / D_L is greater than 1.1.

52. The invention of Claim 51 wherein the ratio D_F / D_L is greater than 1.4.

53. The invention of Claim 51 wherein the ratio D_F / D_L is greater than 1.8.

54. The invention of Claim 51 wherein each foot angles downwardly and outwardly from the respective leg assembly.

55. The invention of Claim 51 wherein each foot comprises a side plate adjacent a lower portion of the respective foot, each side plate extending outwardly and downwardly from the respective foot to create a ramp extending transversely to the respective one of the additional diaphragm and the first-mentioned diaphragm.

56. The invention of Claim 51 wherein the first-mentioned leg assembly comprises the guide and wherein the additional leg assembly comprises an additional guide, the guide and additional guide each centered on the centerline and comprising a first pair of spaced plates facing the

centerline on one side of the centerline and a second pair of spaced plates facing the centerline on the other side of the centerline.

Sub C6
57. ~~The invention of Claim 19, 21, or 35 further comprising:~~

an additional diaphragm;

an additional energy absorbing element disposed between the additional diaphragm and the first-mentioned diaphragm;

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an additional leg assembly, the additional leg assembly and the first-mentioned leg assembly each comprising an upper portion mounted to a respective one of the additional diaphragm and the first-mentioned diaphragm, a lower portion, two side portions, and a centerline extending between the side portions;

each said lower portion connected to two feet shaped to support the respective leg assembly on the support surface;

the feet extending outwardly from the respective leg assembly, away from the centerline, such that the feet are separated from the respective centerline by a maximum distance D_F , the side portions are separated from the respective centerline by a maximum distance D_L , and the difference $D_F - D_L$ is greater than 4 cm.

58. The invention of Claim 57 wherein the difference $D_F - D_L$ is greater than 8 cm.

59. The invention of Claim 57 wherein the difference $D_F - D_L$ is greater than 12 cm.

60. The invention of Claim 57 wherein each foot angles downwardly and outwardly from the respective leg assembly.

61. The invention of Claim 57 wherein each foot comprises a side plate adjacent a lower portion of the respective foot, each side plate extending outwardly and downwardly from the respective foot to create a ramp extending transversely to the respective one of the additional diaphragm and the first-mentioned diaphragm.

62. The invention of Claim 57 wherein the first-mentioned leg assembly comprises the guide and wherein the additional leg assembly comprises an additional guide, the guide and additional guide each centered on the centerline and comprising a first pair of spaced plates facing the centerline on one side of the centerline and a second pair of spaced plates facing the centerline on the other side of the centerline.

63. The invention of Claim 19, 20, or 21 wherein the support structure comprises at least three axially aligned, releasably interconnected support structure segments, wherein the support structure is anchored to the support surface near a first end of the support structure, near a second end of the support structure, and intermediate the first and second ends of the support structure.

64. The invention of Claim 19, 20, or 21 wherein the guide is substantially centered with respect to the diaphragm.

Sub C7
65. ~~The invention of Claim 19, 20, or 21 wherein the support structure is substantially centered with respect to the diaphragm.~~

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66. ~~The invention of Claim 20 further comprising an additional diaphragm and an additional guide coupled to the additional diaphragm, the additional guide mounted to slide along the support structure, wherein one support structure segment is shaped to restrict movement of the first-mentioned diaphragm with respect to the support structure in at least one lateral direction and wherein another support structure segment is shaped to restrict movement of the additional diaphragm with respect to the support structure in at least one lateral direction.~~

Sub C8
67. ~~The invention of Claim 19, 20, or 21 further comprising an additional element, the energy absorbing element being disposed between the diaphragm and the additional element.~~

68. ~~The invention of Claim 67 further comprising a fender panel extending alongside the diaphragm and the additional element.~~